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PATENT SPECIFICATION

Application Date: Feb. 22, 1944. No. 3281/44. 575,043

Complete Specification Accepted: Jan. 31, 1946.

COMPLETE SPECIFICATION

Improvements in or relating to Reinforced Concrete Slabs, Plates or other Concrete Bodies, and the Manufacture thereof

I, KARL MATSSON, a subject of the King of Sweden, of 15 Luntmakaregatan, Stockholm, Sweden, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In the construction of continuous slabs or plates, bracket plates or the like, of reinforced concrete, such as floor slabs and the like, reinforcement is required in both the lower and upper parts of the slab or plate, the upper reinforcing rods being usually supported on intermediate supports. In order that the strength of the concrete slab or plate may be as calculated, it is essential that the reinforcing rods or bars should be located in predetermined positions in the slab.

The reinforcing rods in the lower part of the slab are usually inserted at a distance of one or more centimetres from the lower edge of the slab and can therefore be easily supported, e.g. with the use of small concrete blocks or equivalent devices, whereas those which have to be embedded in the upper part of the slab or plate are usually laid on special fitting irons, which in turn rest on supports or supporting frames. These supports are for the most part made on the site, out of ordinary reinforcing rods, which are bent into such a shape that the fitting irons can be laid on, and fastened to, the supporting frames thus formed. This simple device, however, is unsatisfactory, in that the fitting irons, which as a rule consist of ordinary reinforcing rods, are usually weak and therefore liable to be deformed. Moreover, supporting frames made in this manner will not always be fitted at the proper level corresponding to the thickness of the concrete slab, but are liable to be placed too low (or too high). Furthermore, if the fastening is not made with the requisite care, the fitting iron may slip down from the supportong frame and hang loose at its side.

In order to eliminate these drawbacks in the construction of continuous concrete slabs and bracket plates, this invention provides means whereby the level of the upper reinforcing rods may be so adjusted that they lie securely fixed at the proper distance from the lower edge of the concrete slab or plate, having regard to the thickness of the latter. For this purpose, according to the invention, the supports or supporting frames are provided with devices for the attachment of the fitting irons at any of a number of various predetermined levels corresponding to the customary differences in the thickness of the slabs or plates.

In order that the invention may be clearly understood and readily carried into practice examples of devices according thereto are illustrated in the accompanying drawing, in which-

Figure 1 is a part sectioned end view of the device with a supporting frame and a fitting iron supported thereby;

Figure 2 is a side view of the same device;

Figures 3 and 4 illustrate in cross section other forms of fitting iron; and

Figure 5 is a section through a concrete slab, provided with fitting irons carried by supporting frames.

The foot of the supporting frame consists of two legs 1, whose lower ends 3 rest on boards 2 forming the bottom of a mould form. The ends 3 are fastened by pins, nails 4, or the like, directed obliquely downwards and outwards, so that the frame is fixed to the said bottom boards 2. The part 5 joining the legs 1 is of such dimensions as to confer some degree of resiliency on the foot. Two uprights or carriers 6, whose opposing edges are formed with a series of recesses 7, situated at different levels and disposed in pairs opposite to one another, are welded, or otherwise suitably fixed, to the said legs 1. The recesses 7 may be arranged at equal or varying distances from one another, and may be shaped as segments of circles, as shown in the drawing, or may have a triangular or other shape. Between the carriers 6 there is disposed a fitting iron, provided e.g. with enlargements 8 (or other shoulder forming parts) joined by a web 9, which should preferably be of considerable length in proportion to its

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breadth. The enlargements 8 may be disposed along both the top edge and the bottom edge of the fitting iron, as shown in Figure 1, or only along the bottom edge as shown in Figure 3, or only along the top edge. The enlargements 8 are arranged so as to engage in the recesses 7 in the carriers 6, so that the fitting iron may rest firmly in the carriers. When the pins 4 (which, if desired, may be replaced by nails or other fastening devices) are driven into the boards 2, the upper portions of the carriers 6, owing to the yielding of the foot parts 1, will be brought closer to one another. Thus the fitting iron will be effectively locked by a pinching action, in consequence of the obliquity of the pins 4 and the yielding of the foot parts 1.

The upper edge of the fitting iron 8, 9 supports the reinforcing rods 10 (see also Figure 5). If desired, this edge may be toothed. When the reinforcing rods 10 have been fitted in place, and when similar rods have been arranged also along the lower part of the plate, concrete 12 is moulded round them, so as to form the required reinforced slab.

Figure 4 shows another construction of fitting iron, consisting of a double-bent flat bar, the lower part of which is shaped as an eye 13 (corresponding to the enlargement 8). In this case the outer radius of curvature is greater than the thickness of the flat bar. The legs 14, 15 entirely or partly contact with one another. Along its upper edge 16 the flat bar 14, 15 may be toothed in order to locate the reinforcing iron 10 more securely.

By facilitating the adjustment of the level of the fitting irons 8, 9 and enabling them to be located in precisely these recesses 7 which are situated at the required height, this invention entails the advantage that the same kind of supporting frames can be used for slabs or plates of different thicknesses.

From the foregoing it will be appreciated that the supporting frames may be made in certain standard sizes on a manufacturing scale, thus cheapening their production. Moreover, due to the pins 4 for securing the foot of the supporting frames, the risk of the frames collapsing or sliding along the mould form is completely eliminated. Furthermore, owing to the adjustability of the supporting frames, the great strength of the fitting irons and the other above-mentioned advantages, the use of this invention affords a complete guarantee of the secure location of the reinforcing rods even in cases where the reinforcement, before and during the moulding, is subjected to the somewhat rough treatment usually attendant upon work carried out on the site.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. Device for the fitting of reinforcing rods in concrete slabs or plates or other concrete bodies, in which the reinforcing rods in the upper part of the slab, plate or body are supported by fitting irons, which in turn rest on supports or supporting frames, characterised by the feature that the supports or supporting frames are provided with means for locating the fitting irons at any of a number of different predetermined levels, corresponding to the usual differences in the thicknesses of slabs or plates.

2. Device in accordance with claim 1, characterised by the feature that the supports or supporting frames consist of a foot part, preferably of resilient nature, comprising a pair of legs, and uprights or carriers spaced at some distance from one another, which are provided on their opposing edges with a series of recesses, arranged in pairs opposite to one another and adapted to receive the fitting irons.

3. Device in accordance with claim 2, in which the recesses are of triangular shape.

4. Device in accordance with claim 2, in which the recesses are shaped as segments of a circle.

5. Device in accordance with claim 2, wherein the two legs of the foot part are fastened at their lower ends by downwardly and outwardly directed nails, pins or similar fastening devices, to the bottom of a moulding form for the concrete body, so that said nails, or the like, when driven in, owing to the yielding of the foot part, bring the upper parts of the uprights or carriers closer to one another, thereby ensuring an effective gripping of the fitting irons.

6. Device in accordance with claim 1, in which the fitting iron consists of a web, the length of which is considerable in proportion to its breadth, and which along its bottom edge and/or along its top edge is provided with an enlarged part.

7. Device in accordance with claim 6, in which the fitting iron consists of a double-bent flat bar, shaped at the bottom as an eye, and with the outer radius of curvature greater than the thickness of the bar.

8. Device in accordance with claim 6 or 7, in which the fitting irons are toothed along their upper edges.

9. Reinforced concrete slabs or plates having locating means for reinforcing rods therein, substantially as herein described with reference to, and as illus-

trated by, the accompanying drawings.

10. Locating means for reinforcing rods in ferro-concrete work substantially as herein described with reference to, and as illustrated by, the accompanying drawings.

Dated this 22nd day of February, 1944.

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[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

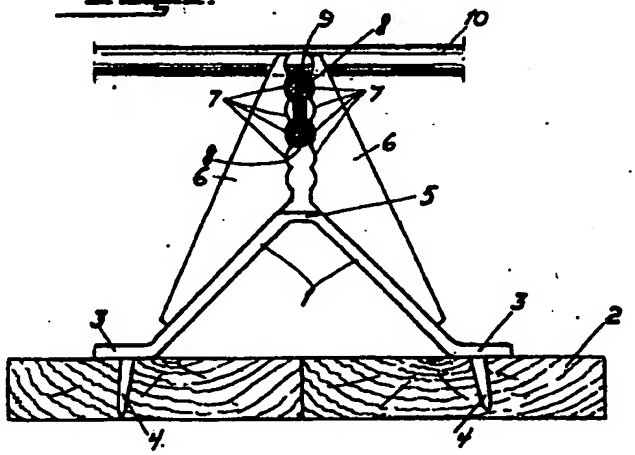


Fig. 2.

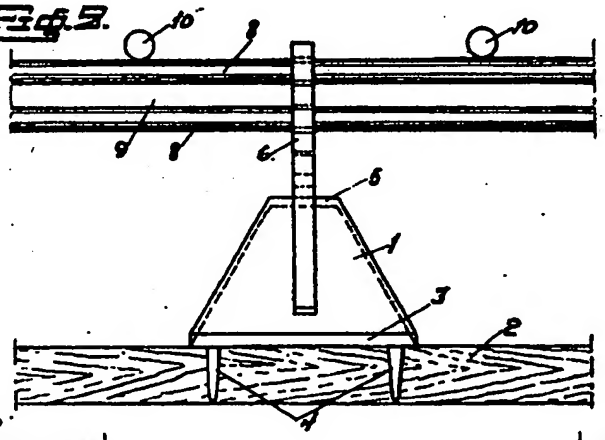


Fig. 3.

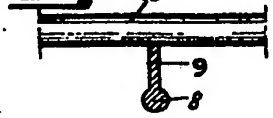


Fig. 4.

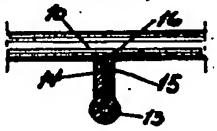
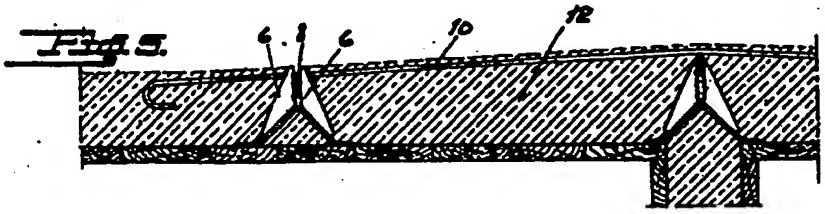


Fig. 5.



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